SONY®

PORTABLE VIDEO CASSETTE RECORDER U-matic S

VO-6800PS

OPERATING INSTRUCTIONS Page 2

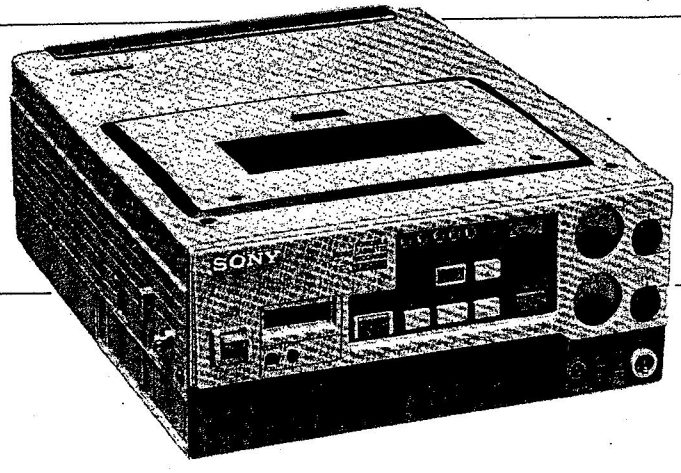
Before operating the unit, please read this manual thoroughly and retain it for future reference.

MODE D'EMPLOI Page 24

Avant d'utiliser cet appareil, nous recommandons de lire attentivement ce mode d'emploi; le conserver pour toute référence ultérieure.

BEDIENUNGSANLEITUNG Seite 48

Vor der Inbetriebnahme lesen Sie diese Anleitung sorgfältig durch und bewahren Sie sie zum späteren Nachschlagen auf.



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English

WARNING

To prevent fire or shock hazard, do not expose the set to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

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FEATURES

The lightweight and compact Sony VO-6800PS U-matic S video cassette recorder is designed for portable use. When used together with a Sony color video camera, the VO-6800PS recorder is ideally suited for outdoor recording.

Portability and versatility

The lightweight, compact VO-6800PS is designed for portable use. It may be operated in either a vertical or a horizontal position. The recorder is free of gyroscopic distortion.

Devices for reliable camera recording

Video confidence
The simultaneous playback picture (the picture which has just been recorded) can be monitored on the camera viewfinder if a camera equipped with a return video button is used together. You can check whether or not the recording has been correctly made.

Protect against the accidental recording interruption
During the camera recording, if the camera is connected to the 14-pin CAMERA connector, only the STOP and EJECT buttons can function. All other buttons are disabled so that the recording will not be interrupted accidentally.

Warning system
The warning lamps blink or light to tell the operator at a glance that the auto shut-off mechanism is functioning due to the end of tape, battery discharge, etc. An audible alarm will sound simultaneously through the earphone. When a camera equipped with a Sony Q type (14-pin) connector is used, the warning lamps in the viewfinder will blink in unison with the warning lamps on the recorder.

Tape remaining time indication
The tape remaining time can be checked on the camera viewfinder screen if a camera equipped with a return video button is used together.

Easy battery replacement
The battery can be easily inserted and removed. In addition, an independent meter is provided for checking the battery condition.

Editing capability

Smooth transition between scenes
Video cassette programs are composed shot-by-shot without any irregularities at scene changes because the quick playback servo system guarantees a clean cut every time.

Two video source assembly
Two video sources can be assembled by switching the VIDEO IN selector.

Audio dubbing
Audio (commentary, music, etc.) can be added to a previous video recording.

Variety of recording and playback functions

High quality audio signal recording
The sendust audio head permits audio recording with high frequency response.

Auto or manual audio recording
While recording, the audio level can be controlled manually (recording with a limiter) or automatically.

Picture search
Pictures can be monitored during the rewind and fast forward modes.

External sync system
The recorder will operate with an external sync system when the video signal is connected to the VIDEO IN connector during playback.

Other features

Logic control
The logic control system allows you to change modes without pressing the STOP button.

Two way power operation
This recorder may be powered by the Sony NP-1 rechargeable battery pack (optional) or the CMA-8CE camera adaptor (optional) for ac power.

Pause mode
The tape may be momentarily stopped in record, dubbing audio or playback mode. A still picture may be obtained in the playback and audio dubbing pause modes.

Real time counter
The time counter reads the CTL signals recorded on the tape and an LCD (Liquid Crystal Display) display indicates the point on the tape in seconds and minutes.

Playback on a conventional TV receiver
Playback can be performed on a conventional TV receiver by means of an optional RF unit.

PRECAUTIONS

On safety
- Operate the unit on 12 V dc. For ac operation, use the CMA-8CE camera adaptor (optional), which operates on 110, 127, 220 or 240 V ac (selectable), 50/60 Hz. Operate the camera adaptor only with the supplied power cord; do not use any other type of cord.
- Should any material, liquid or solid, fall into the cabinet, unplug the ac power cord if the camera adaptor is used, and have the unit checked by qualified personnel before operating it further.

On installation
Keep the unit away from strong magnetic fields, high temperature and excessive dust and moisture.

On operation
- Avoid subjecting the unit to unnecessary shock or impact.
- Never operate the unit right after having transported it from a cold location directly to a warm location.

On cleaning
Clean the cabinet periodically with a soft dry cloth. Do not use solvent, such as alcohol, benzine or thinner, which will damage the finish.

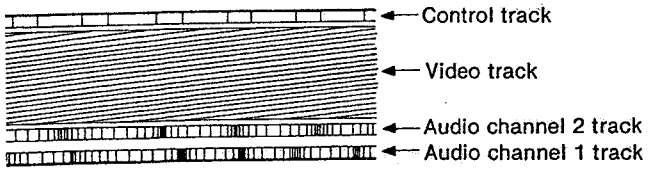
On transportation
Save the carton and associated packing material. These will be useful to transport or ship the recorder.

If you have any questions about this unit, contact your authorized Sony dealer.

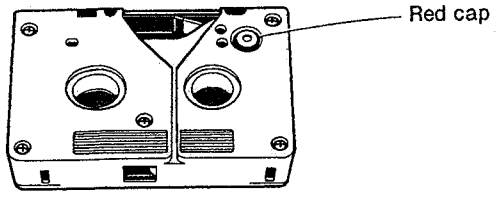
NOTES ON VIDEO CASSETTE

Usable cassette
Always use a KCS type video cassette, KCS-20, KCS-10 or equivalent.

Recording format
Because the full width of the tape is used for recording the picture and sound, the tape is recorded in one direction only.



Safety cap on the bottom
Video cassette [S] incorporates a convenient safety device to prevent accidental erasure.
To safeguard the material recorded on a cassette, remove the red cap on the bottom of the cassette. To record on this cassette later, replace the cap.



Handling and storage
- Always store the video cassette [S] in the cassette case when it is to be carried or mailed.
- Store the cassette in the cassette case vertically, after first rewinding the tape evenly on the supply reel.
- Do not store a video cassette in a place subject to direct sunlight, high humidity, excessive dust, near heat sources such as radiators or air ducts, or magnetic field.
- Avoid subjecting the cassette to mechanical shock.

LOCATION AND FUNCTION OF PART AND CONTROLS

CONTROL PANEL

❶ EJECT button
Press to raise the cassette compartment for insertion or removal of the video cassette.
If a cassette is inserted when the power is on, the tape is threaded, and the recorder is set to the stop mode. When the button is pressed to remove a cassette, the tape will be unthreaded, and the cassette compartment will pop up.

❷ Digital tape counter
This counter counts the CTL signals on the tape during playback, and the CTL signals being recorded during recording and indicates the tape running time at the normal playback speed in minutes and seconds.

❸ RESET button
Press to reset the tape counter ❷ to "00 00".

❹ LIGHT button
Press to illuminate the digital tape counter ❷.

❺ REC (record) button/lamp
For recording, press the PLAY button while pressing this button. While recording, the REC lamp will blink.
If only this button is pressed in the stop mode, the E-to-E mode picture* will be displayed on the viewfinder and the monitor screen. Adjust the audio level and allow time for the camera to warm up by setting the recorder in the E-to-E mode.
During the fast forward, rewind or the playback mode, the E-to-E mode picture can be monitored while this button is being pressed.

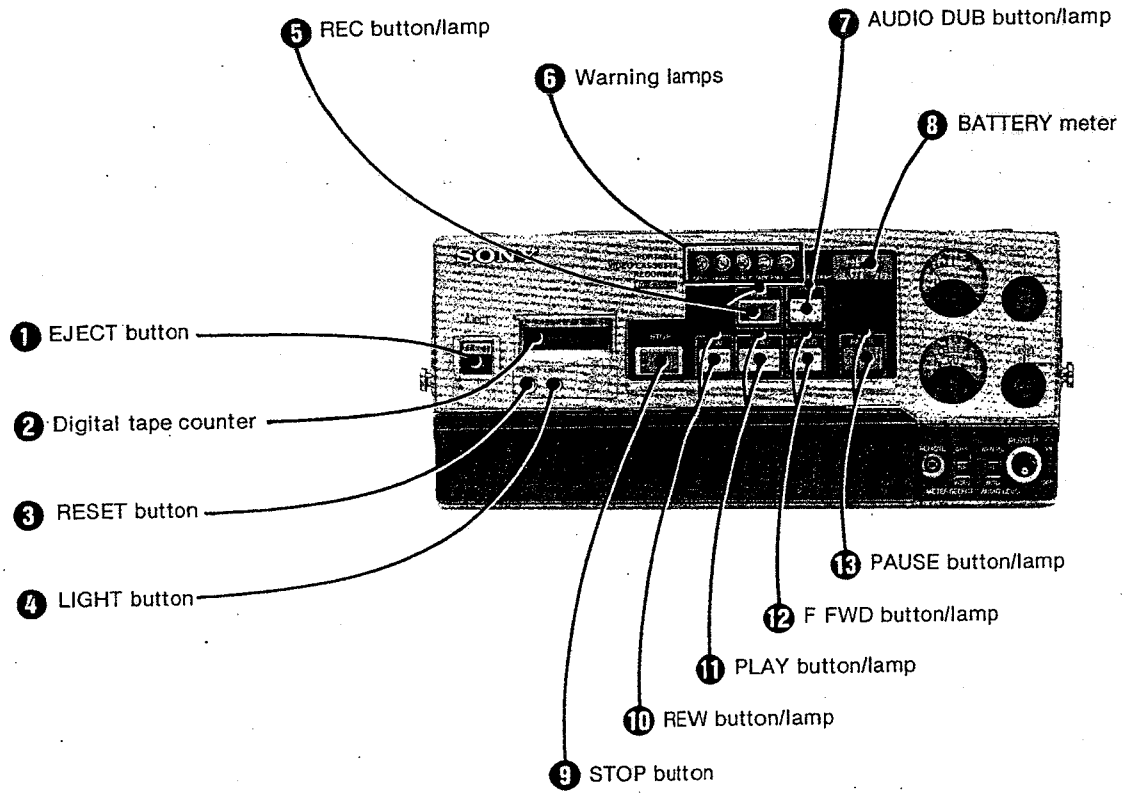
***E-to-E mode picture**
The input video signal which has passed through the amplifier in the recorder is displayed on the monitor. This is the E-to-E (Electronics to Electronics) mode picture.

❻ Warning lamps
These lamps display the operating state of the VTR.

SERVO lamp
Blinks when the drum servo and capstan servo are not locked.

HUMID lamp
Lights when moisture condensation has formed on the head drum or when the humidity is very high.

SLACK lamp
Blinks when the tape is slack on the take up side (from the capstan to the take up reel) of the tape transport system or when the stop of the drum rotation is detected. At the same time, the tape run is automatically stopped in order to prevent the tape from becoming entangled in the transport system.

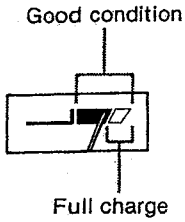


TAPE END lamp
Blinks for several minutes before the end of the tape—for about 1.5 minutes when using Sony KCS-20 or KCS-10 video cassette tape. However, this length varies if a video cassette other than Sony's product is used. The lamp lights when the tape comes to the end, and the tape transport is automatically stopped.

BATTERY lamp
Blinks when the voltage supplied by the internal NP-1 battery pack(s) falls below 11.45 V, indicating that the batteries are almost exhausted. The lamp lights up steadily when the voltage falls to 11 V, and the tape transport is automatically stopped.

❼ AUDIO DUB (dubbing) button/lamp
For audio dubbing, press this button while pressing the PLAY button.
When only this button is pressed, audio recording level adjustments can be made before starting audio dubbing.

❽ BATTERY meter
This meter displays the level of the power voltage.



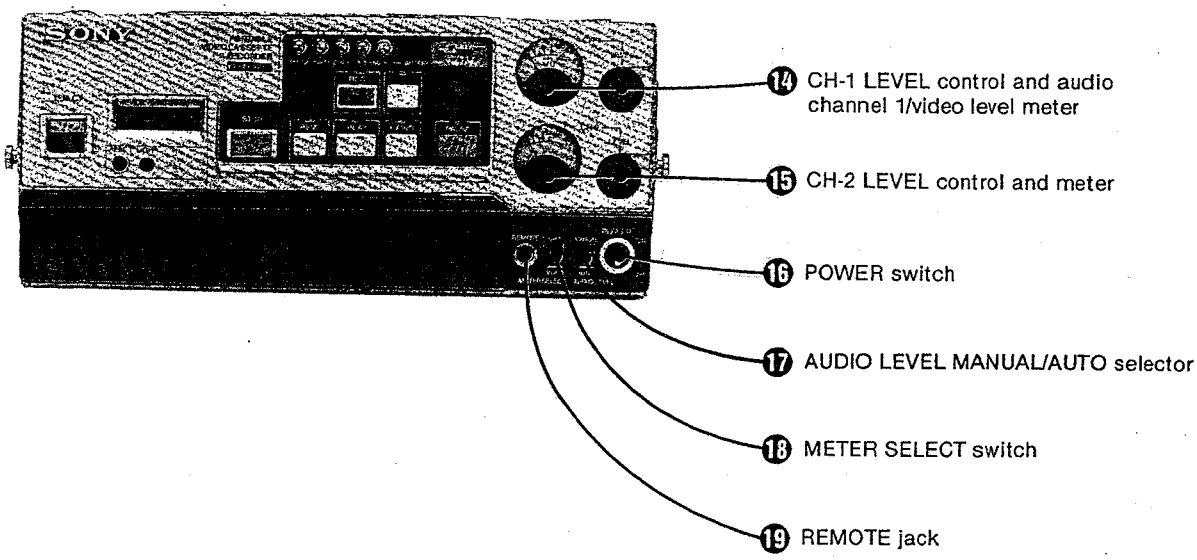
❾ STOP button
Press to stop the unit's operation.

❿ REW (rewind) button/lamp
Press to rewind the tape. The recorded signal on the tape will be displayed on the viewfinder and the monitor screen with guard band noise (picture search).

⓫ PLAY button/lamp
Press to play back the tape. To begin a recording, press this button while pressing the REC button.

⓬ F FWD (fast forward) button/lamp
Press to advance the tape rapidly. The recorded signal on the tape will be displayed on the viewfinder and monitor screen with guard band noise (picture search).

⓭ PAUSE button/lamp
Press to momentarily stop the tape in the record or playback mode. The lamp will blink during the pause mode. Press this button again to release the pause mode. During the playback pause mode, a still picture will be displayed.
- The PAUSE button cannot function during recording if the recording is started by pressing a remote control switch on the camera, when the camera is connected to the CAMERA connector. In this case, start/stop of the tape can be done with a remote control switch on the camera. For details, see page 11.
- After more than about 8 minutes in the pause mode of operation, the pause mode will be automatically released, and the recorder enters the stop mode.


⑭ CH-1 LEVEL control and audio channel 1/video level meter
⑮ CH-2 LEVEL control and meter
⑯ POWER switch
⑰ AUDIO LEVEL MANUAL/AUTO selector
⑱ METER SELECT switch
⑲ REMOTE jack

⑭ CH-1 LEVEL control and audio channel 1/video level meter
To adjust the audio channel 1 recording level manually, set the AUDIO LEVEL MANUAL/AUTO selector to MANUAL and the METER SELECT switch to CH-1 and then adjust the control while watching the level meter.
The CH-1 LEVEL meter indicates the audio channel 1 output level during the playback mode.
The CH-1 LEVEL meter is also used as the video level meter. Set the METER SELECT switch to VIDEO, and check the video signal level.

⑮ CH-2 LEVEL control and meter
To adjust the audio channel 2 recording level manually, set the AUDIO LEVEL MANUAL/AUTO selector to MANUAL and adjust the control while watching the level meter.
The CH-2 LEVEL meter indicates the audio channel 2 output level during the playback mode.

⑯ POWER switch
Set to ON to turn on the recorder. A number will appear on the digital tape counter when the power is supplied. If a cassette is inserted after turning on the recorder, the tape will be threaded around the head drum and the recorder will enter the stop mode.
Power will be supplied to a camera, if connected, when the POWER switch is set to ON.

⑰ AUDIO LEVEL MANUAL/AUTO selector
To adjust the audio recording level automatically, set the selector to AUTO. The automatic gain control regulates the audio levels to assure optimum recording.
To adjust the audio recording level manually, set the selector to MANUAL. The audio limiter circuitry will be activated to minimize audio distortion at the peaks.

⑱ METER SELECT switch
Select the display mode of the CH-1 LEVEL meter ⑭: audio channel 1 input/output level (CH-1) or video input level (VIDEO).

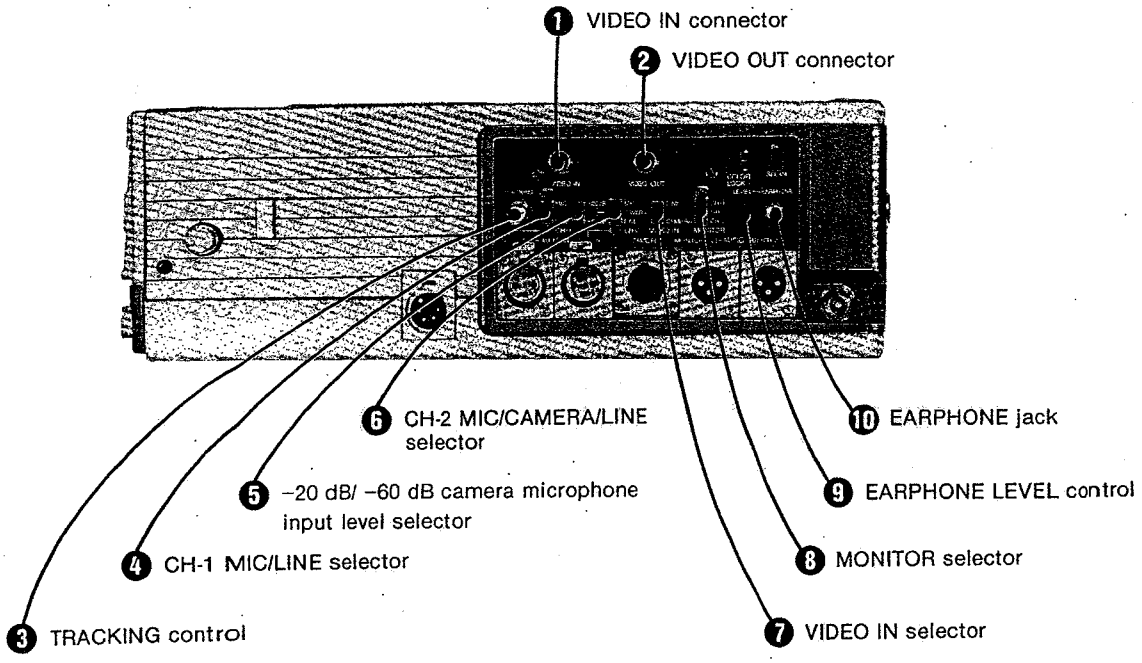
⑲ REMOTE jack (special mini jack)
Connect the RM-680 remote control unit (optional).

CONNECTOR PANEL

❶ VIDEO IN connector (BNC type)
For connecting with a video output from another video cassette recorder/player, camera or color video monitor, use this connection.

❷ VIDEO OUT connector (BNC type)
For connecting a video input of a TV receiver/monitor or a video cassette recorder, use this connection.

❸ TRACKING control
To correct tracking deviation when playing back tapes recorded on other machines, adjust this control.


1 VIDEO IN connector
2 VIDEO OUT connector
6 CH-2 MIC/CAMERA/LINE selector
10 EARPHONE jack
5 –20 dB/ –60 dB camera microphone input level selector
9 EARPHONE LEVEL control
4 CH-1 MIC/LINE selector
8 MONITOR selector
3 TRACKING control
7 VIDEO IN selector

❹ CH-1 MIC/LINE selector
Depending on the audio source used for the AUDIO IN CH-1/L/DUB connector ⓬, select the appropriate position.
MIC: To use a microphone for the audio input.
LINE: To use other audio inputs.

❺ –20 dB/ –60 dB camera microphone input level selector
Depending on the microphone level of the comera connected to the CAMERA connector ⓮, select the appropriate position: –20 dB or –60 dB.
If a microphone is connected to the AUDIO IN CH-1/L/DUB or the AUDIO IN CH-2/R connector, the setting of this selector is not required.

Setting examples

Camera used	Selector setting
DXC-1800 series	–60 dB
DXC-1820 series	–60 dB
DXC-M3 series	–60 dB
DXC-M3A series	–20 dB or –60 dB

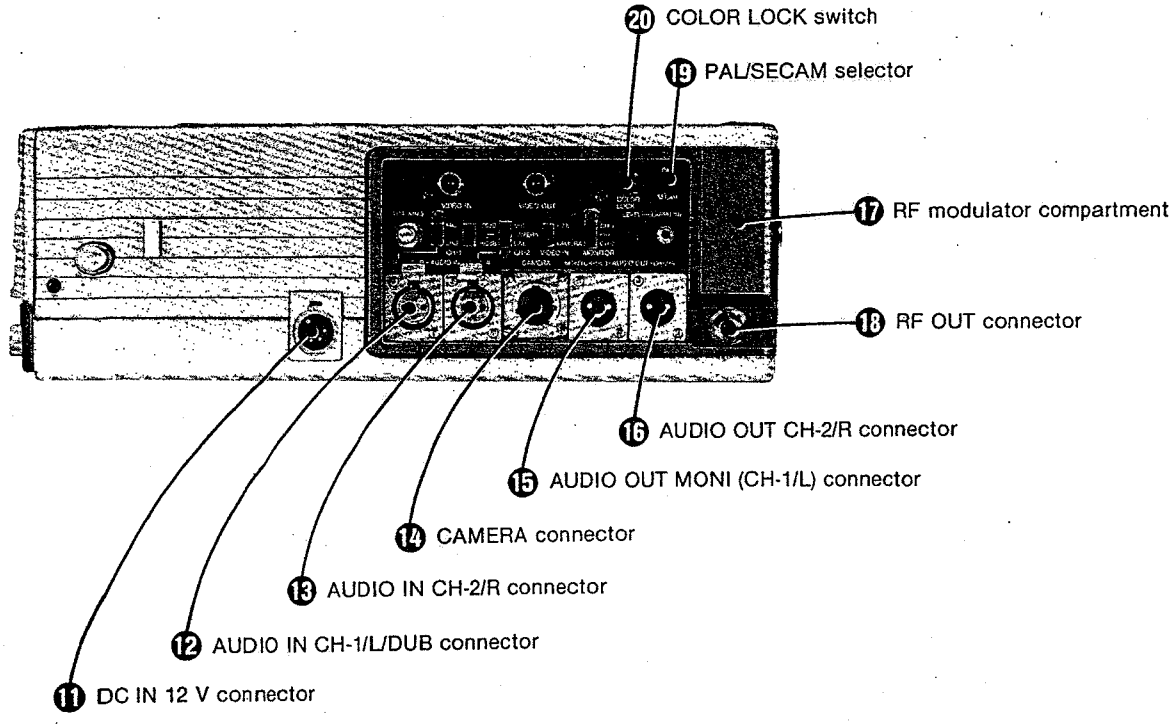
❻ CH-2 MIC/CAMERA/LINE selector
Depending on the audio source used for the audio channel 2, select the appropriate position.
MIC: To use a microphone connected to the AUDIO IN CH-2/R connector ⓭.
CAMERA: To use the audio input supplied to the CAMERA connector ⓮.
LINE: To use other audio inputs connected to the AUDIO IN CH-2/R connector ⓭.

❼ VIDEO IN selector
Select the video input signal when video sources are connected to both the VIDEO IN ❶ and CAMERA ⓮ connectors.
LINE: The video signal supplied to the VIDEO IN connector is selected.
CAMERA: The video signal supplied to the CAMERA connector is selected.
When the video signal is connected to only one of the VIDEO IN or CAMERA connector, the setting of this switch will be ignored and the input signal connected to the recorder will be selected.

❽ MONITOR selector
Select the audio outputs from the EARPHONE jack ⓾ and AUDIO OUT MONI (CH-1/L) connector ⓯.
CH-1: Audio output of channel 1
MIX: Mixed audio output of channels 1 and 2
CH-2: Audio output of channel 2

❾ EARPHONE LEVEL control
Adjust the earphone level with this control.
It is also possible to adjust the audio level of the video monitor when the monitor is connected to the CAMERA connector ⓮ using the VMC-1MQ cable (optional).

❿ EARPHONE jack (mini)
The audio to be recorded or being played back can be monitored by connecting the supplied earphone ME-20H to this jack. The MONITOR selector ❽ is used to select the channel: CH-1, CH-2 or MIX.
If any of the warning lamps is blinking, a beep will sound in the earphone.


⑳ COLOR LOCK switch
⑲ PAL/SECAM selector
⑰ RF modulator compartment
⑱ RF OUT connector
⑯ AUDIO OUT CH-2/R connector
⑮ AUDIO OUT MONI (CH-1/L) connector
⑭ CAMERA connector
⑬ AUDIO IN CH-2/R connector
⑫ AUDIO IN CH-1/L/DUB connector
⑪ DC IN 12 V connector

⑪ DC IN 12 V connector (XLR, 4-pin)
Connect with the CAMERA/CCU connector of the CMA-8CE camera adaptor (optional) using the supplied CCQX-2 cable.

⑫ AUDIO IN CH-1/L/DUB connector (XLR type)
Connect a micropone or an audio line input source for the recording of the audio channel 1 or for audio dubbing.
The audio signal level must be selected with the CH-1 MIC/LINE selector ❹.

⑬ AUDIO IN CH-2/R connector (XLR type)
Connect a micropone or an audio line input source for the recording of the audio channel 2.
The audio signal level must be selected with the CH-2 MIC/CAMERA/LINE selector ❻.

⑭ CAMERA connector (Q type, 14-pin)
Connect the output signal of a Sony color video camera or a video monitor.
A color camera equipped with a Q-type connector can be connected directly to this connector.
A video monitor equipped with an 8-pin connector can be connected by using an optional VMC-1MQ cable.

⑮ AUDIO OUT MONI (CH-1/L) connector (XLR type)
The audio signal selected by the MONITOR selector ❽ is supplied from this connector.

⑯ AUDIO OUT CH-2/R connector (XLR type)
The audio output signal of channel 2 is supplied from this connector.

⑰ RF modulator compartment
Install an RF modulator (optional). For details, see page 19.

⑱ RF OUT connector (DIN type)
When playing back programs onto a conventional TV receiver, attach the TV receiver antenna terminals to this connector.

⑲ PAL/SECAM selector
When playing back the tape, set this selector to the proper position according to the color system of the recorded tape, PAL or SECAM. During recording, it may be effective for obtaining a higher quality picture to set this selector to PAL or SECAM according to the program to be recorded.

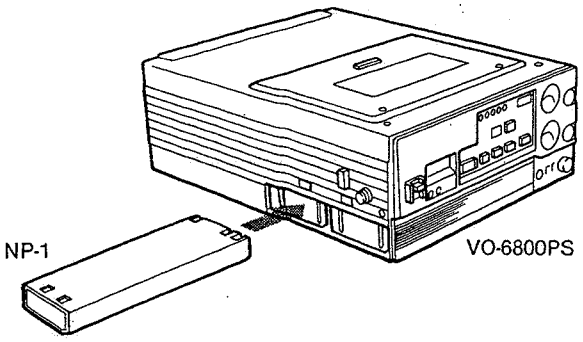
⑳ COLOR LOCK switch
Normally set the switch to the center position. If the picture should suddenly lose color or does not maintain correct hue, set the switch to the position + or –, where the normal picture is obtained.

POWER SOURCES

The VO-6800PS video cassette recorder can operate either from one or two rechargeable battery pack(s) NP-1 or from an ac power source using a CMA-8CE camera adaptor (optional).

BATTERY

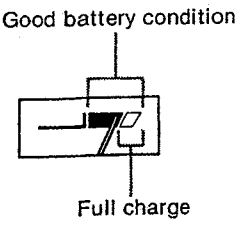
Installation
Insert one or two battery pack(s) as illustrated.



To remove
Press the EJECT button above the battery compartment.

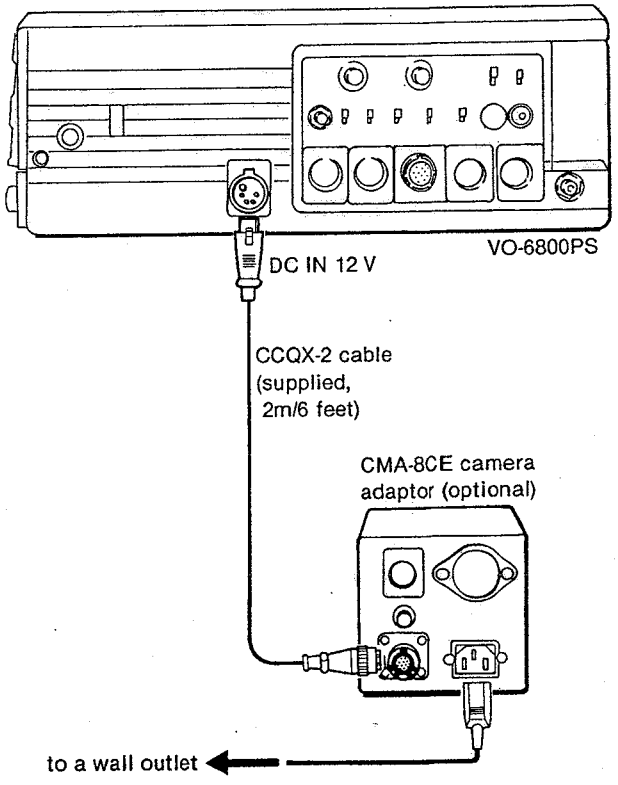
Notes on battery
- Before using the battery pack, always charge it by using the BC-1WA battery charger. The charging time is about 1 hour at normal temperatures. For details on charging, please read the instruction manual of the BC-1WA.
- The battery pack may not be charged if you try to recharge it immediately after it has been used. If this happens, wait for a few minutes before attempting to recharge it again.

Battery life
A fully charged battery provides approximately half hour of continuous operation when used together with the DXC-M3 series camera. With two batteries, the operation time will be 1 hour. The BATTERY meter indicates battery condition. If the pointer approaches the left end of the black zone, replace the battery with a fully charged one.
When the voltage of the NP-1 falls below its rated value, the BATTERY lamp will blink, and after several minutes, the recorder will automatically stop.
If the recorder is set in the record or playback mode using a battery having a low terminal voltage, it will not operate.



AC POWER

Before connecting the CMA-8CE camera adaptor (optional) to a wall outlet, check that the operating voltage is identical with the voltage of your power supply.

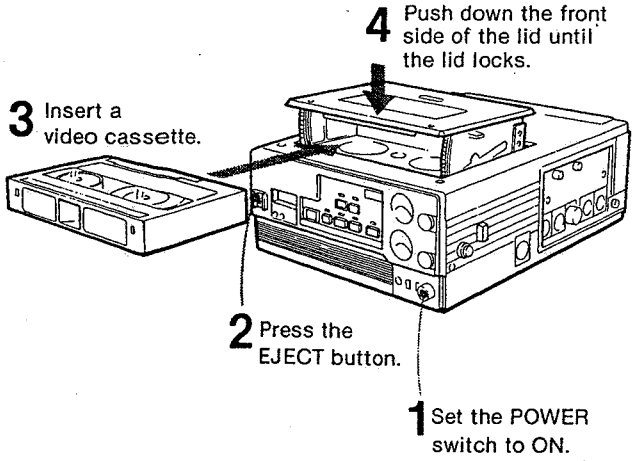


Notes
- When the camera adaptor is connected to the DC IN 12 V connector, power supply from the batteries is automatically disconnected.
- Do not plug in the cord or unplug it from the DC IN 12 V connector of the recorder during battery operation, because this may cause tape slack.

VIDEO CASSETTE S INSERTION

● Before inserting, take up the slack in the tape by turning the reels manually.

INSERTION


4 Push down the front side of the lid until the lid locks.
3 Insert a video cassette.
2 Press the EJECT button.
1 Set the POWER switch to ON.

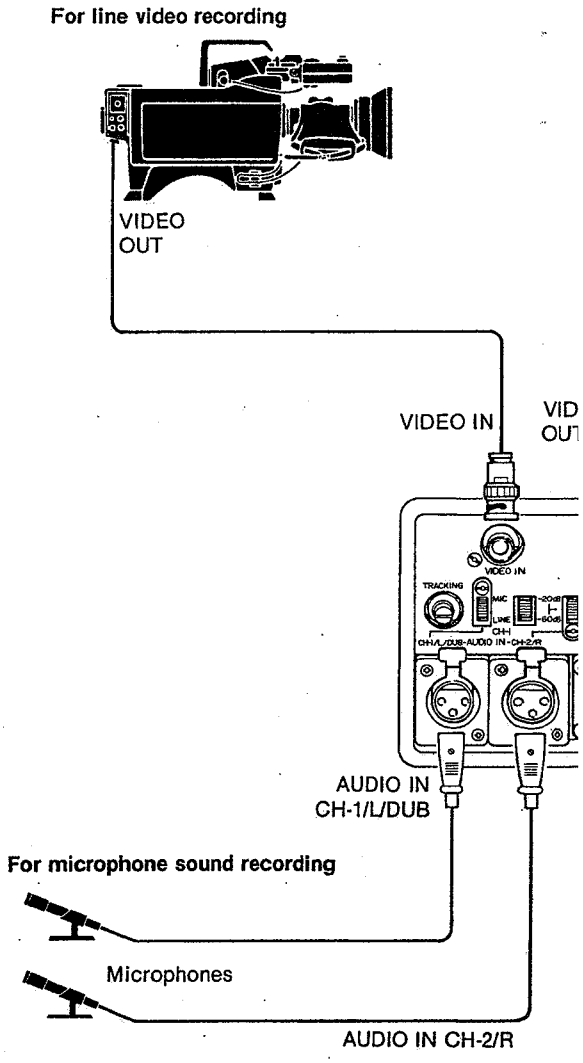
Note
If the HUMID lamp lights when the POWER switch is set to ON, the moisture has condensed inside the machine. If this happens, do not insert a cassette. Turn off the power and wait until the HUMID lamp does not light when the power is turned on.

To remove
Make certain that the recorder is turned on, and press the EJECT button.

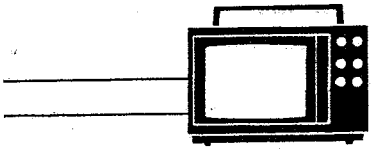
RECORDING

CAMERA RECORDING

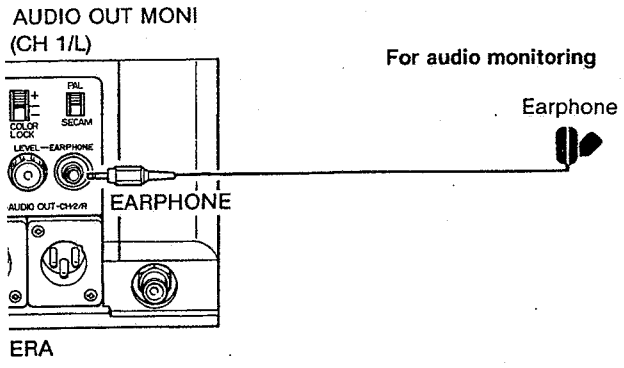
Connections



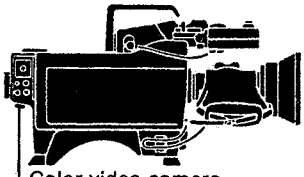
For video and audio monitoring



Video monitor



For camera recording



Color video camera
equipped with the
Q type connector

Operation

The PAL/SECAM selector on the connector panel of the recorder is recommended to be set to the appropriate position according to the program to be recorded so that the higher picture quality will be assured.

1 Insert a video cassette.
Make certain that the red cap is in place on the bottom of the video cassette.

2 Press the REC button so that the E-to-E mode signal is displayed on the monitor screen.

3 Make the necessary adjustments on the camera.

4 Adjust the audio recording level.
To record the sound automatically
Set the AUDIO LEVEL MANUAL/AUTO selector to AUTO.
To adjust manually
1) Set the AUDIO LEVEL MANUAL/AUTO selector to MANUAL.
2) For the audio channel 1 adjustment, set the METER SELECT switch to CH-1.
3) Adjust the audio channel 1 or 2 recording level by turning the CH-1 or CH-2 LEVEL control, so that the pointer of the level meter swings up to 0 dB at its maximum deflection.

5 While pressing the REC button, press the PLAY button. The recorder will be in the recording standby mode.
● The recording will start just after the REC and PLAY buttons are pressed if a camera is connected to the VIDEO IN connector.

6 Start recording by pressing the remote control switch on the camera or the PAUSE button on the recorder.

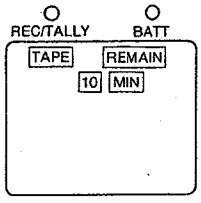
7 To stop recording momentarily, press the remote control switch on the camera again.

8 At the end of the recording, press the STOP button on the recorder.

Pause operation
To stop the tape momentarily during camera recording, press the remote control switch on the camera or the PAUSE button on the recorder. The PAUSE lamp on the recorder will blink during the pause mode. The E-to-E mode signal will remain displayed on the monitor connected to the recorder.
To release the pause mode, press the remote control switch on the camera again or the PAUSE button on the recorder.
- If the recording has been started with the PAUSE button on the recorder, it can be stopped with the PAUSE button and also with the remote control switch on the camera.
- If the recording has been started with the remote control switch on the camera, it can be stopped only with the remote control switch. The PAUSE button cannot stop recording.
- The pause mode will be automatically released after about 8 minutes of use, and the recorder will set in the stop mode, in order to protect the tape and the video heads.

To check the video signal being recorded (simultaneous playback picture)
To check whether or not the camera recording is correctly made, press the return video button on the camera. While the return video button is pressed, the simultaneous playback picture is displayed on the viewfinder screen, with the tape remaining time indication.

Tape remaining time indication
During recording, while the return video button on the camera is pressed, the tape remaining time is displayed on the simultaneous playback picture.



Tape remaining time	20	15	10	5	4	3	2	1.5	0 min.
Indication	15 MIN	10 MIN	5 MIN	4 MIN	3 MIN	2 MIN	1 MIN	TAPE BEFORE END	*

* The indication disappears.

If the tape will not run in the record mode
The tape will not run if a video signal is not supplied. If this happens, check the pointer of the CH-1 LEVEL meter. When the METER SELECT switch is set to VIDEO, it should be in the blue zone, indicating a sufficiently strong video signal.

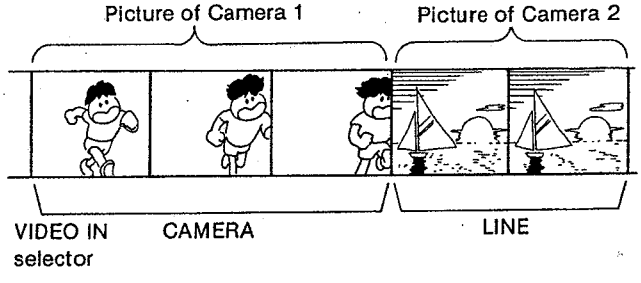
Stereo sound recording
To record stereo sound, connect the microphones to the AUDIO IN CH-1/L/DUB and CH-2/R connectors. Set the CH-1 MIC/LINE and CH-2 MIC/CAMERA/LINE selectors to MIC.
When the microphone is connected to the AUDIO IN CH-2/R connector, the microphone built into, or connected to, the camera will be automatically disconnected.

ASSEMBLY RECORDING

Two video sources—one from the VIDEO IN connector, the other from the CAMERA connector—can be assembled by switching the VIDEO IN selector.
For instance, suppose two cameras are used as sources. (For the connections, refer to pages 10 and 11.)

1. Connect the camera cable of one camera (Camera 1) to the CAMERA connector and the video output connector of the other camera (Camera 2) to the VIDEO IN connector.
2. Press the REC button on the recorder and adjust each camera while monitoring the viewfinder or the monitor screen.
   Turn the VIDEO IN selector to view each camera.
3. Set the VIDEO IN selector to CAMERA for Camera 1.
4. While pressing the REC button, press the PLAY button and start recording by pressing the remote control switch on the camera.
5. At the desired point, stop recording by pressing the remote control switch on the camera again.
6. Set the VIDEO IN selector to LINE for Camera 2.
7. Continue recording by pressing the PAUSE button on the recorder after the VIDEO IN selector is set to LINE for more than 3 seconds.

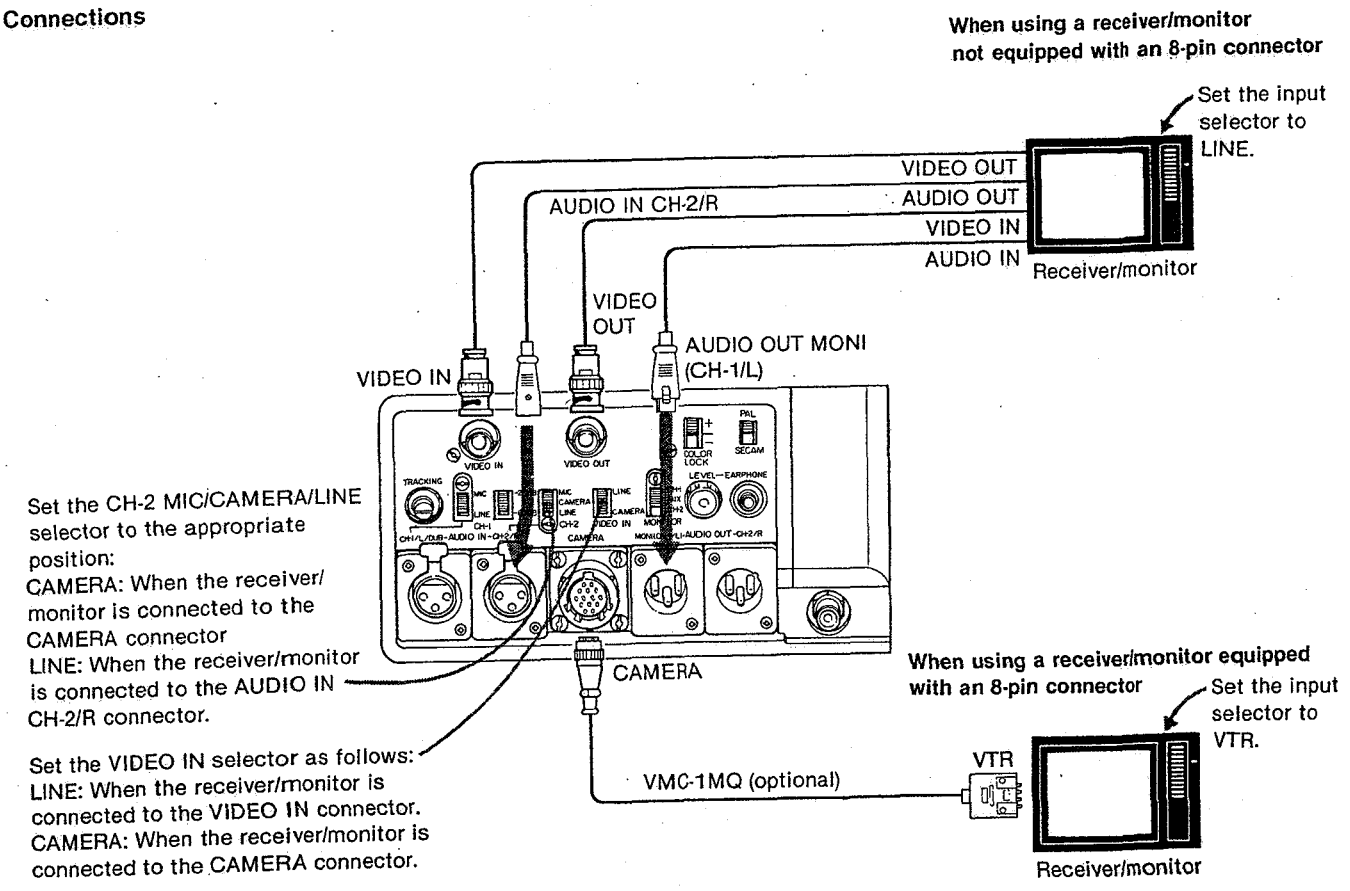
When assembly is finished, press the STOP button on the recorder.



- If two cameras are synchronized with the same reference signal, you can smoothly change the picture from one camera to another during tape running (without using the pause mode) simply by switching the VIDEO IN selector.

RECORDING TV PROGRAMS

Connections


When using a receiver/monitor not equipped with an 8-pin connector
Set the input selector to LINE.
VIDEO OUT
AUDIO OUT
VIDEO IN
AUDIO IN
Receiver/monitor
AUDIO IN CH-2/R
VIDEO OUT
AUDIO OUT MONI (CH-1/L)
VIDEO IN
Set the CH-2 MIC/CAMERA/LINE selector to the appropriate position:
CAMERA: When the receiver/monitor is connected to the CAMERA connector
LINE: When the receiver/monitor is connected to the AUDIO IN CH-2/R connector.
Set the VIDEO IN selector as follows:
LINE: When the receiver/monitor is connected to the VIDEO IN connector.
CAMERA: When the receiver/monitor is connected to the CAMERA connector.
CAMERA
When using a receiver/monitor equipped with an 8-pin connector
Set the input selector to VTR.
VTR
VMC-1MQ (optional)
Receiver/monitor

Caution
Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws.

Operation

The PAL/SECAM selector on the connector panel of the recorder is recommended to be set to the appropriate position according to the program to be recorded so that the higher picture quality will be assured.

1 Insert a video cassette.
Make sure that the red cap is in place on the bottom of the video cassette.

2 Press the REC button so that the E-to-E mode signal is displayed on the monitor screen.

3 Set the input selector of the monitor in accordance with the connectors being used.
VTR: When the 8-pin VTR connector of the receiver/monitor is used
LINE: When the video line input of the receiver/monitor is used

4 Select the TV program and adjust the receiver/monitor controls for the best possible picture reception.

5 Adjust the audio recording level.
To record the sound automatically
Set the AUDIO LEVEL MANUAL/AUTO selector to AUTO.
To adjust manually
1) Set the AUDIO LEVEL MANUAL/AUTO selector to MANUAL.
2) For the audio channel 1 adjustment, set the METER SELECT switch to CH-1.
3) Adjust the audio channel 1 or 2 recording level by turning the CH 1 or CH 2 LEVEL control, so that the pointer of the level meter swings up to 0 dB at its maximum deflection.

6 While pressing the REC button, press the PLAY button. The recording will begin.

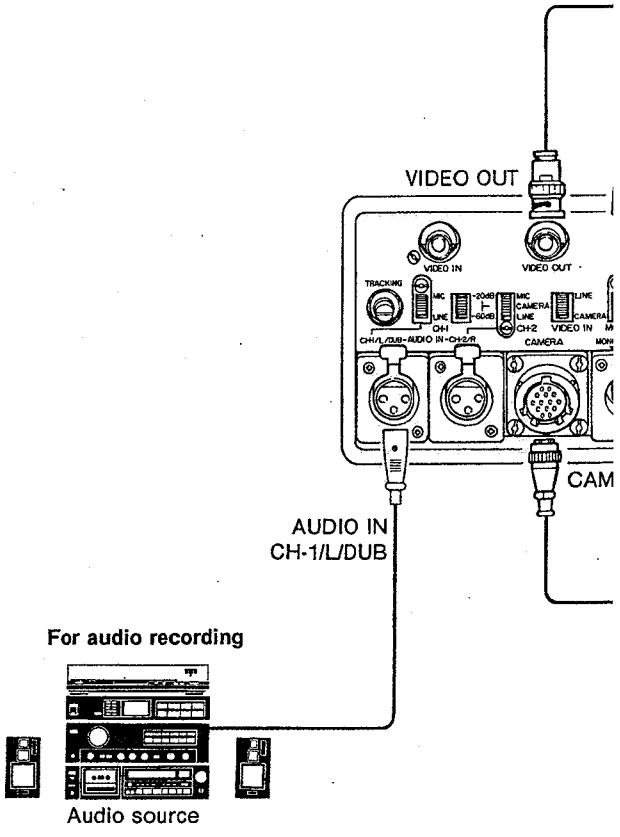
To momentarily stop the recording

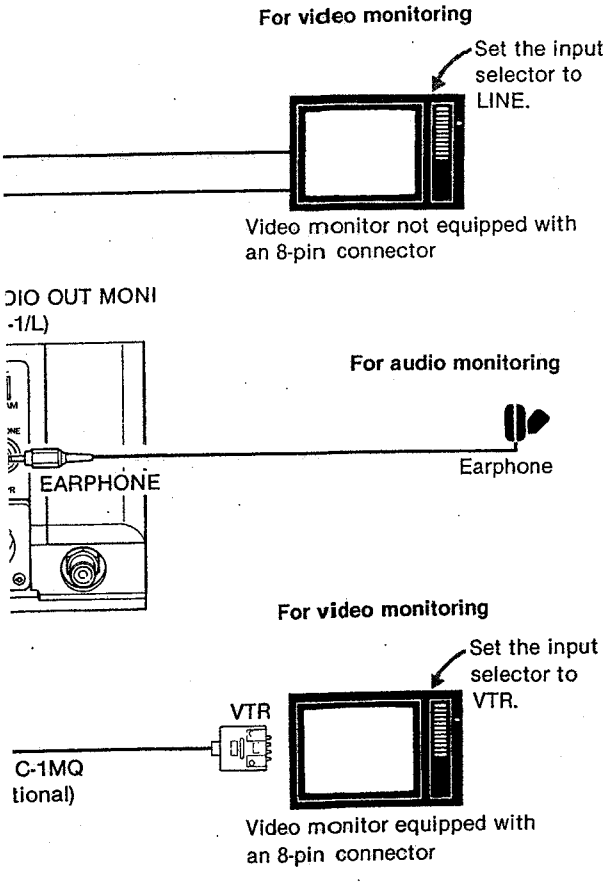
Press the PAUSE button on the recorder. The PAUSE lamp will blink during the pause mode. The E-to-E mode signal remains displayed on the monitor screen.
To restart the recording, press the PAUSE button again.
●The pause mode will be automatically released after about 8 minutes of use, and the recorder will set in the stop mode in order to protect the tape and the video heads.

AUDIO DUBBING

New sound can be recorded onto a prerecorded tape. The audio dubbing will be made on the audio channel 1 track.

Connections





Operation

TV volume should be turned down to prevent acoustic feedback (whistle-like sound).

1 Insert a video cassette. Make sure that the red cap is in place on the bottom of the video cassette.

2 Adjust the audio recording level.
To adjust the level automatically
Set the AUDIO LEVEL MANUAL/AUTO selector to AUTO.
To adjust manually
1) Set the AUDIO LEVEL MANUAL/AUTO selector to MANUAL.
2) Set the METER SELECT switch to CH-1.
3) Press the AUDIO DUB button.
4) Adjust the audio channel 1 recording level by turning the CH-1 LEVEL control, so that the pointer of the level meter swings up to 0 dB at its maximum deflection.

3 Play the tape while monitoring the playback picture.

4 When the portion desired for audio dubbing is searched, press the PAUSE button.

5 While pressing the AUDIO DUB button, press the PLAY button.

6 Press the PAUSE button again. The pause mode will be released, and the audio dubbing will begin.
●To monitor the sound, set the MONITOR selector on the connector panel to CH-1. The sound can be monitored through the earphone.

7 When the audio dubbing is completed, press the STOP button.

WARNING SYSTEM

During recording, the warning lamps, earphone tone and camera (with the Q type connector) tally lamps serve to advise the operator of the following operational states.

Warning lamps		Earphone tone	State	Camera tally lamps		VTR operation
Lamp	Operation			REC/TALLY	BATT*2	
SERVO*1	◔ (While in the recording mode)	∧∧∧∧∧∧∧∧	Irregularity in servo	◔		Recording continues. Recording may not be performed correctly.
HUMID	○ (In all modes)	∧∧∧∧∧∧∧∧	Moisture condensation	◔		Recording continues, if the recorder is in the record mode, as long as the tape does not stick to the head drum. If this happens or the unit is in any of the other modes, the recorder will stop. Remove the cassette by pressing the EJECT button.
SLACK	◔ (In all modes)	∧∧∧∧∧∧∧∧	Tape slack	◔		Recording stops. Remove the cassette by pressing the EJECT button. If the cassette compartment will not raise, keep the recorder's power on and contact your authorized Sony dealer.
TAPE END	◒ (While in the recording mode)	∧∧	Near end	◒		Recording continues.
	○*3 (In all modes)	∧∧∧∧∧∧∧∧*3	Tape end	◔*3		Recording stops. Change the cassette.
BATTERY	◒ (In all modes)	∧∧ (While in the recording mode)	Near end	◒	◒	Recording continues.
	○ (In all modes)	∧∧∧∧∧∧∧∧	Discharge	◔	○	Recording stops. Change the batteries.

Meaning of the marks

Lamps	Sound of alarm
◔ Blinks in 4 Hz	∧∧ 1 second interval
◒ Blinks in 1 Hz	∧∧∧∧∧∧∧∧ 1/4 second interval
○ Lights up	∧∧∧∧∧∧ Continuous sound

*1 If the SERVO lamp blinks, check the connections.
*2 The BATT tally lamp functions when the VTR's battery pack or the camera's battery pack are exhausted.
*3 After the recording stops, the lamp and the earphone tone will go off.

Notice on moisture condensation

Moisture may condense on the drum assembly if the recorder is moved directly from a cold to a warm location or if the recorder is used in a very humid place. This may result in damage to the tape when it adheres to the head drum. To avoid this, take the following precautions.

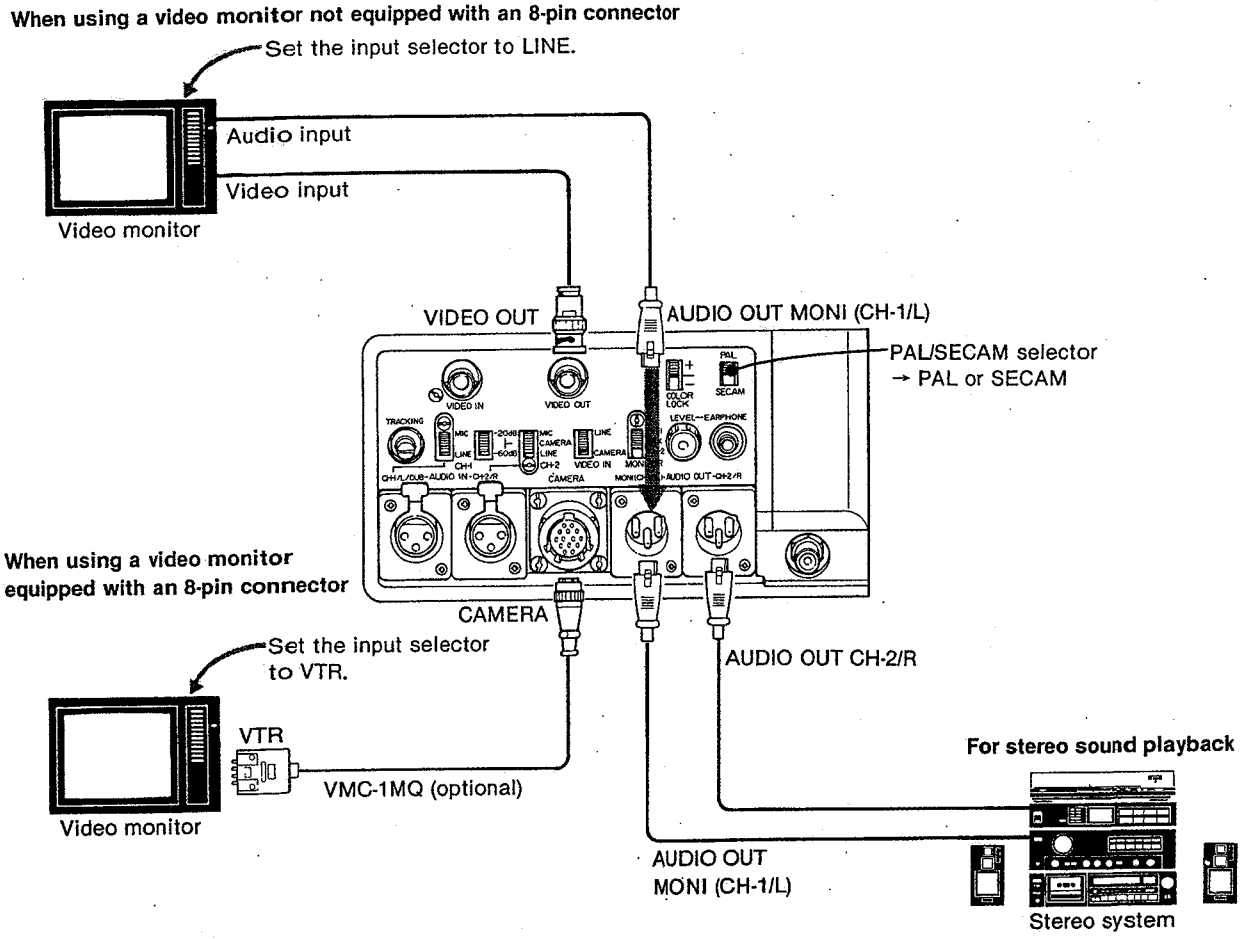
- When the recorder is moved directly from a cold location to a warm locations, be sure to remove the cassette.
- Before inserting a cassette, set the POWER switch to ON and check that the HUMID lamp does not light. If it lights, do not insert a cassette. Turn off the power and wait until the HUMID lamp does not light when the power is turned on.
- If moisture has condensed in the VTR with a cassette inserted, proceed as follows:

If the POWER switch is set to OFF, set the POWER switch to ON. Press the EJECT button to remove the cassette. Turn off the power and wait until the HUMID lamp does not light when the power is turned on.

PLAYBACK

PLAYBACK ON A MONITOR

Connections



Operation

Set the PAL/SECAM selector to the appropriate position according to the tape to be played back.

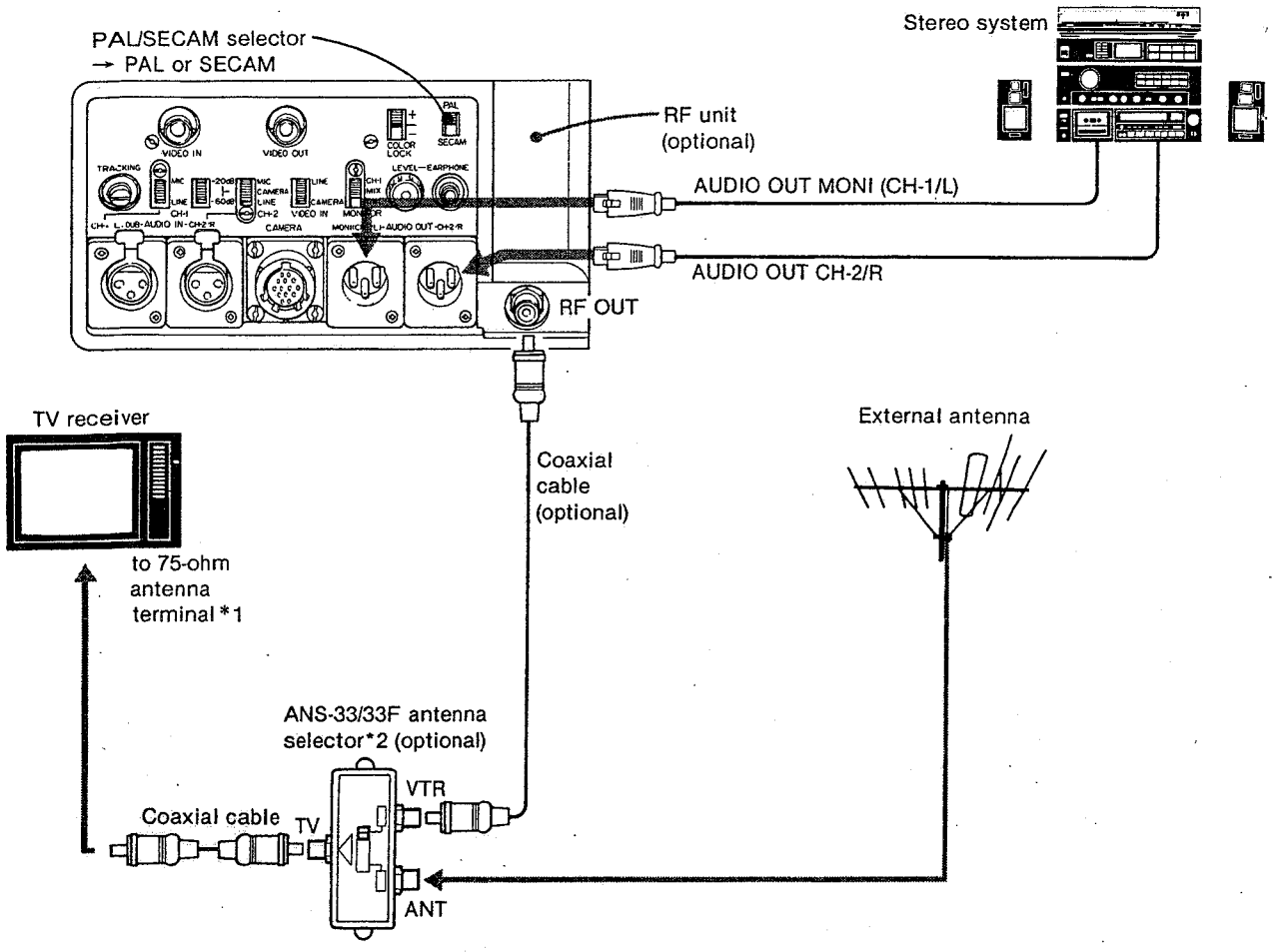
1 Insert a recorded video cassette.

2 Set the input selector on the monitor according to the connector used on the video monitor.
VTR: When using an 8-pin connector
LINE: When using the video input connector

3 Press the PLAY button. The playback will begin.

PLAYBACK ON A CONVENTIONAL TV RECEIVER

Connections

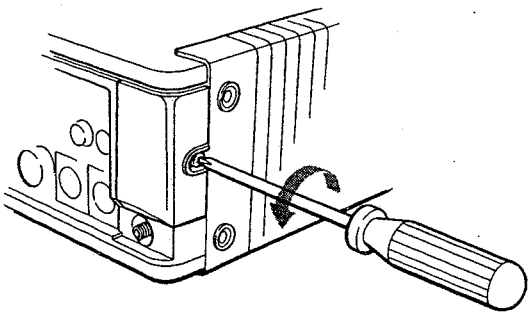


*1 If the TV receiver is equipped with a 75-ohm antenna terminal, connect the antenna selector ANS-33/33F (optional) directly to the receiver. If the TV receiver is equipped only with 300-ohm antenna terminals, connect the ANS-33/33F to the receiver through a commercially available matching transformer.

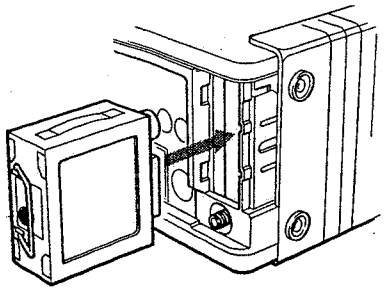
*2 Set the VTR/ANT switch:
VTR: To see the playback picture
ANT: To see the TV program

RF unit installation and setting
Install an RF unit (optional) to monitor the playback signal from the recorder on a TV receiver.

1 Open the cover of the RF unit compartment.



2 Install the RF unit.



3 Close the cover.
For details, please refer to the instruction manual furnished with the RF kit.

Operation
Set the PAL/SECAM selector to the appropriate position according to the tape to be played back.

1 Insert a recorded video cassette.

↓

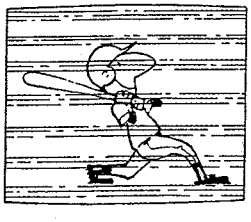
2 Turn the TV on, and set the channel to the output channel of the RF unit.

↓

3 Press the PLAY button on the recorder.

PICTURE SEARCH

You can search for a particular picture by pressing either the F FWD or REW button (picture search). The picture will be displayed with the guard band noise.



If the picture rolls vertically or an irregular picture appears in the picture search mode, adjust the vertical hold control on the monitor.
On some monitors, the picture in the picture search mode may become monochrome.

TO MOMENTARILY STOP THE PLAYBACK

Press the PAUSE button. A still picture will be obtained. In some cases, the still picture may lose color or be unable to maintain correct hues, depending on the monitor.
- The pause mode will be automatically released after about 8 minutes of use, and the recorder will be set in the stop mode, in order to protect the tape and the video heads.

TRACKING ADJUSTMENT

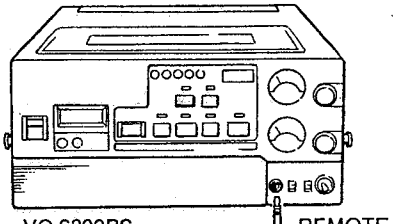
In some cases, streaks or snow may appear in the playback of tapes made on other video cassette recorders. To correct this condition, turn the TRACKING control screw in either direction with a screwdriver until the best possible picture is obtained.
After playback of this particular tape, return the screw to the center detent position.

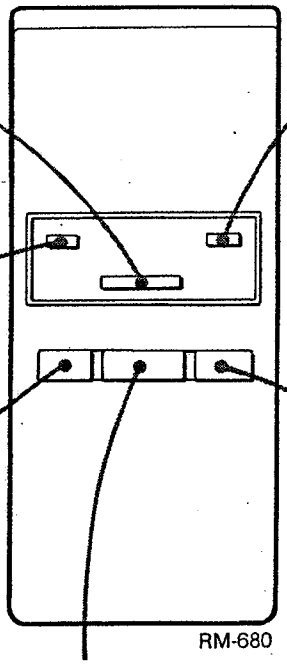
COLOR LOCK ADJUSTMENT

The video cassette recorder is preadjusted at the factory to produce correct color. Therefore, it is rare that adjustment of color lock will be required. However, if the picture should suddenly lose color or does not maintain correct hue, adjust the COLOR LOCK switch on the connector panel. Set the switch to the position + or −, so that a normal picture is restored. When playback of this particular tape is finished, return the switch to its center position.

REMOTE CONTROL

With the RM-680 remote control unit (optional), operation can be remotely controlled from as far as 5 meters.





STOP button
Press to stop the operation.

PAUSE button
Press to momentarily stop the tape in the record or playback mode.

REC (record) button
Press this button simultaneously with the PLAY button to set the recorder in the record mode.

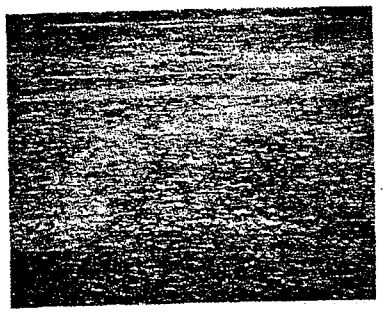
REW (rewind) button
Press to rewind the tape.

F FWD (fast forward) button/lamp
Press to advance the tape rapidly.

PLAY button
Press to play back the tape. To initiate a recording, press this button while pressing the REC button.

VIDEO HEAD CLEANING

If the picture completely disappears at times or if only snow or streaks appear on the monitor screen, the video heads may be dirty. Clean the heads using the KCS-1C cleaning cassette (optional).



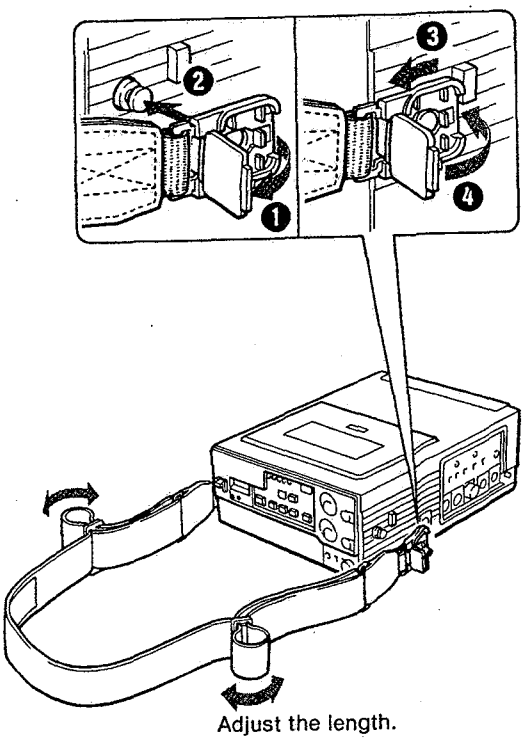
Insert a cleaning cassette and set the recorder in the record mode by pressing the REC and PLAY buttons simultaneously. Press the STOP button after about 30 seconds. To count the time, if the input video signal is available, reset the tape counter to "00 00" and make the tape run until the counter indicates "00 30".

Notes

- Do not run a cleaning cassette for more than 30 seconds at a time, nor use it unless the picture symptoms clearly indicate the need for head cleaning. Excessive use of the cleaning cassette will shorten the life of the heads.
- Do not rewind the cleaning cassette every time it is used. Run the tape to its end, and then rewind it.
- A cleaning cassette can be used several times, although it does gradually become less effective each time.

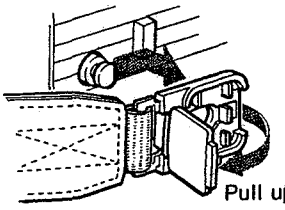
SHOULDER STRAP

The supplied shoulder strap can be attached to the VTR and the machine carried on the operator's shoulder. Attach the both ends of the strap to the knobs at either side of the machine.



Adjust the length.

To detach



Pull up tab.

SOFT CARRYING CASE

Use the supplied soft carrying case to protect the recorder against the rain or dust.

SPECIFICATIONS

General

Power requirements	12V dc
Power consumption	DC 16 W
Connectors	VIDEO IN: BNC type, × 1 CAMERA: Q type, 14-pin, × 1 VIDEO OUT: BNC type × 1 AUDIO IN CH-1/L/DUB and AUDIO IN CH-2/R: XLR type, female, × 1 each AUDIO OUT MONI (CH-1/L) and AUDIO OUT CH-2/R: XLR type, male, × 1 each DC IN 12V: XLR type, × 1 RF OUT: DIN type REMOTE: Special mini type
Operating position	Both vertical and horizontal
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	−20°C to +60°C (−4° F to +140°F)
Dimensions	Approx. 258 × 117 × 338 mm (w/h/d) ($10^{1}/_{4} \times 4^{5}/_{8} \times 13^{3}/_{8}$ inches) not incl. projecting parts and controls
Weight	Approx. 5.5 kg (12 lb 2 oz)

Video

Video head	Rotary 4 head (R/P: 2, Simultaneous playback: 2)
Video recording system	Helical scanning, FM recording
Video signal system	CCIR-standards, PAL or SECAM color signal
Input	Composite, sync negative 1 V (p-p) $^{+1.0}_{-0.5}$ V (p-p), 75 ohms, unbalanced
Output	Composite, sync negative 1 V (p-p)±0.2 V(p-p), 75 ohms, unbalanced
Horizontal resolutions	250 lines
Signal to noise ratio	Color: Better than 45 dB

Audio

Input	CAMERA (microphone input): −20 dB/−60 dB switchable, more than 3-kohm impedance, balanced AUDIO IN CH-1/L/DUB and AUDIO IN CH-2/R: Line input: +4 dB, More than 10-kohm impedance, balanced Microphone input: −60 dB, More than 3-kohm impedance, balanced
Output	AUDIO OUT MONI (CH-1/L) and AUDIO OUT CH-2/R: +4 dB (at 600 ohm load), balanced EARPHONE: −20 to −33 dB (at 8 ohm load), adjustable
Signal to noise ratio	Better than 50 dB (at 3% distortion)
Frequency response	50 Hz - 15,000 Hz

Tape transport

Tape speed	9.53 cm/sec. (3.75 ips)
Wow and flutter	Less than 0.2 % DIN
Recording time	20 min. continuously with KCS-20, 10 min. continuously with KCS-10
Rewind and fast forward time	Within 3 min. (KCS-20)
Operating time	Approx. 1 hour continuously to a DXC-M3 series camera and the recorder, with two NP-1 fully charged batteries
Interchangeability	Fully interchangeable with all conventional U-matic recorder/player
Usable tape	KCS type tape

Special functions

Simultaneous playback picture and tape remaining time indication	Possible with a camera having the return video function
Pause	Possible
Search	Possible (about 10 times of normal speed in forward and reverse directions)
Edit	Audio dubbing
Tracking control	Possible
Remote control	Recording, playback, fast forward, rewind, pause and stop, with an optional RM-680 remote control unit

Accessories supplied

Carrying case (soft) 1
Shoulder strap 1
CCQX-2 (2m, 6 feet) cable for the CMA-8CE camera adaptor 1
Earphone ME-20H 1

While the information given is true at the time of printing, small production changes in the course of our company's policy of improvement through research and design might not necessarily be indicated in the specifications. We would ask you to check with your appointed Sony dealer if clarification on any point is required.

Notice

This appliance conforms with EEC Directives 76/889 and 82/499 regarding interference suppression.

Optional accessories

CMA-8CE camera adaptor
BC-1WA battery charger
RM-680 remote control unit
AH-6800 Handle
NP-1 rechargeable battery
RFK-660UCE/660UF/660CH RF modulator
KCS-10, KCS-20 video cassette tape
KCS-1C cleaning cassette
Color video camera DXC-1800 series, DXC-1820/1821 series, DXC-M3 series, DXC-M3A series, etc.

REPACKING FOR SHIPMENT

The repacking procedure is subject to change. Refer to the packing instructions on the original carton as well as those shown here.